Review Article

Get lean and go green: Role for "Eat-ology" behavior modification

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Abstract

Obesity rates are rising exponentially reaching global epidemic proportions and are associated with substantially increased morbidity and mortality. Less appreciated are the serious risks this poses on our environment from increased greenhouse gas emissions related to obesogenic behavior. In spite of a plethora of diets, the results are short term and nonsustainable, thereby leaving individuals battling with more weight than they lost. This is likely attributable to inherent flaws in the nature of weight loss diets or perhaps the approach of implementing them. These grim realities will be exposed to lead the way to uncover a novel "behavior modification for weight loss" strategy called Eat-ology. It exposes eating errors and imparts techniques to transform them into eating essentials, thereby enabling weight loss and its long-term maintenance. It is through such approaches that we can hope to win the fight against obesity and achieve not only a leaner global society but also a greener environment.

Keywords: Eating behavior, Eat-ology, obese, global warming, greenhouse gas emissions

Introduction

Obesity is associated with well-known and serious health consequences, and is most significantly related to increased risks of cardiovascular, metabolic syndrome-associated diseases,[1-3] and hormone-dependent cancers.[2,3] Moreover, they also include a myriad of additional ailments affecting various other organ systems, as well as physical, emotional, and psychological challenges. Although there are clear benefits in addressing obesity at the individual level, namely to circumvent its many related morbidities, however, it is equally important to include its control among the most crucial initiatives to reduce our carbon footprint and sustain our planet. The justifications for this will be reviewed in the face of the escalating obesity rates as well as the failure of current strategies to impact it. Through an appreciation of these grim realities, a glimmer of hope perspective will be presented, including the introduction of a new eating methodology, which helps empower individuals to take the leap into a leaner self and a greener environment.

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The Grim Realities

The Magnitude of GLOBESITY

Worldwide, obesity trends have witnessed a dramatic increase in the past 40 years,[4] with current global estimates of 39% of the entire adult population being overweight and 13% obese.[4] According to 2016 WHO Global estimates, this amounts to nearly 2 billion affected persons across the globe. Although the globesity epidemic is rapidly spreading, there are regional disparities with the highest rates seen in the Western Pacific Islands—nearly 4-fold world averages.[5] The Eastern Mediterranean countries are similarly witnessing high prevalence, with overweight and obesity rates reaching 73 and 38%, respectively.[6] The most disturbing statistic, however, is the exponentially rising rates of childhood

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and adolescent obesity with a greater than 10-fold increase, from 11 million in 1975 to 124 million currently.[4] Moreover, the combined number of obese and overweight children between the ages of 5 and 19 is a whopping 340 million.[4] This phenomenon appears to trickle down into children under the age of 5, with an estimated 41 million globally being overweight.[4]

Obesity and Global Warming

It is quite interesting to explore how excess weight around the waist can in fact impact climate change. Simplistically, similar to stresses exerted by the extra weight on our joints, so does the additional food consumed beyond our requirements, which lead to strains on our ecosystem. It is easy to understand how overconsumption can result in more greenhouse gas emissions from the supplementary required resources for food production and processing. Although it has been estimated that the average American generally consumes substantially more calories than they need,[7] overweight and obese individuals seem to contribute to it disproportionately. This major association between obesity and global warming has been extensively studied and various theories have been proposed for their significant interaction.[8] On the basis of theoretical modeling, comparing a population mix with a high percentage of overweight individuals to that with a normal proportion, Edwards and Roberts[9] estimated that the overweight population require 19% more food energy. This would then result in increased carbon dioxide emissions of between 0.4 and 1.0 gigatons per year, not only from the required increases in food production but also from obesity-related lifestyle needs. This is exemplified by preference to drive rather than walk, need for larger cars, and consequent increased fuel requirement for larger cars and heavier persons.[10] In addition, it has been reported by the Centre for Disease Control (CDC) that[11] for every 10 pounds gained by the average American, airlines consume 350 million more gallons of fuel to carry the additional weight, generating an estimated 3.8 million extra tons of carbon dioxide. Carbon footprint was also assessed by Serafini and Toti,[12] whereby they introduced the idea of metabolic food waste (MFW) quantification which is defined as the food eaten in excess of physiological needs. They suggested that the average amount of MFW was 63.1 and 127.2 kg/capita in overweight and obese persons, respectively. It is easy to appreciate how these numbers can become astronomically exaggerated from a population-level perspective.

There are numerous other publications on the subject and many rising controversies related to the added burden on overweight individuals for shouldering the environmental impact of their excess weight. Be that as it may, and not to play the blame game, however, no matter how you slice it, overeating which leads to weight gain is costing us. These costs are over and above the burden borne at the individual level, as there are additional societal expenditures to address the needs of overweight persons as well as inherent insensible losses. These include escalating health care costs of obesity-related morbidities and loss of productivity, which are further exacerbated by the superimposed serious strain and even threat to our environment. The reality is that we cannot continue to consume as we have been and expand our global potbellies. Reducing obesity has become a global priority, which can only be achieved through sustainable diets. This will in turn enable better allocation of economic resources and more importantly reduction in greenhouse gas emissions, ultimately saving our planet for future generations.

The Problem with Diets

There are numerable and varied published weight loss diets, however, most of them yield comparable short-term results.[13] In fact, the mere prevalence of this huge number would suggest that no one particular diet is superior to the rest.[14] Worse still is the fact that diets seem to invariably result in subsequent weight regain and more importantly, a significant proportion of dieters rebound even further regaining more weight than they lost.[15] As a result, it has been suggested that little long-term benefit is derived from standard dietary restriction, highlighting them as potentially counterproductive.[16]

Evidently, it appears that there are serious pitfalls in today's diets as we know them, making them practically unsustainable. This is because of their restrictive nature, whereby they are not easily integrate-able or even compatible with one's eating styles or way of life. Their underpinnings rely on imparting the individual with lists of "prohibited" food items and specified calorie-limited portion sizes despite countless temptations. In addition to being tightly fixed and limiting, the main problem with such recommendations is their depriving nature, which strongly belies their nonsustainability. Furthermore, it has been suggested by Brewer that neurobiological mechanisms related to eating may be the main culprit for the failure of diets, and hence proposed that attention to these mechanisms is needed for effective interventions.[16]

Our findings seem to support this, as we identified prevalent eating behavior patterns in overweight and obese individuals that might preclude successful implementation of dietary restrictions for the purpose of weight control. Through an administered outpatient questionnaire involving more than 400 patients,[17] we uncovered first that there was serious evidence for a "disconnect" with oneself. This was manifested by meal decisions that were not based on cravings or innate hunger cues. Furthermore, there was a significant disregard for internal satiety signals and feedback from previous meal experiences. In fact, more than three-quarters of our cohort stopped eating only after experiencing significant symptoms of overeating and over half reported meal-related guilt as well as frequent meal dissatisfaction, yet the majority rarely took into account their prior meal feedback. The second important finding was the high speed of food intake with nearly half consuming their meals in 5–10 min; a phenomenon of speed feeding promoting overconsumption. Finally, we uncovered significant cultural influences on one's eating behavior, which seriously promote overeating. These included people-pleasing behavior and an inability to refuse food offerings, especially from

close family. It can be easily seen how these social pressures can add to other influences such as mirroring and facilitation. We suspect that these eating errors are likely widespread and may, in fact, be significant factors not only in promoting weight gain but also in sabotaging weight control efforts. These are usually overlooked in obesity management and deserve focused attention if we are to achieve weight loss and maintain it in the long term.

A Glimmer of Hope

The Clustering of Obesity: An Achievable Opportunity

Perhaps, a consoling fact in coping with this obesity Tsunami is that more than half of the entire globe's obese population are clustered in top 10 countries, namely US, China, India, Brazil, Mexico, Russia, Egypt, Turkey, Iran, and Nigeria.[18,19] Similarly, childhood obesity is principally focused in China and India; the former having the highest numbers nearing 15.3 million.[20] Furthermore, almost half of overweight children under 5 years are living in Asia.[4] This suggests that even though challenging, the problem is not insurmountable because targeted efforts in the most densely aggregated regions can yield stellar results impacting sheer obesity numbers.

The Tangible Impact of Weight Loss on Climate Change

Although it appears that the amount of CO2 produced is proportionate to body mass implying that heavier persons contribute more to its production, conversely and just as importantly, weight loss can significantly ameliorate this relationship. According to Gryka,[21] each kilogram of weight loss achieved decreases CO2 production by 3.2 ml/min, resulting from a drop in resting metabolic rate. It can be seen how this adds up where a 10 kg weight loss will result in 168 12 l of CO2 less per year, and for a population of 1.5 billion the reduction would be phenomenal estimated at 49.56 Mt CO2 per year, a 0.2% reduction in global emissions.[21] Although this reduction in and of itself might seem insignificant, however, it only accounts for the reduced personal CO2 production. Added to this are the aforementioned contributions resulting from reduced food consumption and hence production and processing as well as decreased fossil fuel energy in transport expenses.[9] In fact, it has been suggested that the benefits derived from weight loss might even be equivalent to those resulting from decreasing the global population.[21]

Although obesity remains an oversized problem, however, fortunately, small reductions in the "oversize" will have a great impact. These are feasible but only through serious individual efforts and dedication. Their achievement, however, could be tremendously facilitated by government initiatives, legislation, marketing strategies, and industry engagement. Calorie offsets have also been proposed as a potential opportunity for food and beverage producers to play an integral role in environmental protection.[22] However, the bottom line is that the most critical element for making a difference is at the individual level. As the currently available diets have left these affected persons hanging onto more weight, it is our obligation to provide them with practical options and support through their journey to gain control over their eating behavior and weight.

Eat-ology: A Disruptive Approach to Dieting

It is apparent that a paradigm shift in our approach to dieting is required, which must include new alternatives to address the identified shortcomings. Importantly, for these to be successfully adopted in the long term, they must be simplified and amenable to portability. They should also empower the individual as well as impart confidence in one's ability to apply and comply with them consistently. This is based on observations by Huttunen-Lenz that for achievement of lifestyle changes, higher self efficacy and positive outcome expectancies are essential in enabling long-term sustainability.[23] In our opinion, restrictive diets should be done away with and instead methods of eating devised that provide tools to overcome challenging personal eating styles and habits as well as to resist social pressures encouraging and even promoting eating. Just as importantly, weight loss management should be addressed by multidisciplinary team approach with attention to mindfulness training, psychological support to address stress and emotional eating, as well as sleep optimization; all being significant facilitators of obesogenic eating behavior.

This was the impetus for the development of "Eat-ology" as a novel "eating for weight loss" methodology and not a diet plan. It is rather a behavior modification process addressing the serious issues that overweight persons truly struggle with, beyond calorie restriction. The foremost strength of this methodology is its ability to help individuals expose their eating errors and acquire skills to transform these into eating essentials. It embodies the imparting of principles to sharpen the individual's awareness of hunger and satiety signals as well as to differentiate between biological versus psychosocial cues for food consumption. It also focuses on replacing speed feeding with mindfulness and connecting with the meal experience, not only to reduce the quantity of food consumed but also to enhance food enjoyment. In addition, it allows the acquisition of tools for incorporating prior meal experiences in future meal decisions and choices. It finally empowers individuals to deal with food cravings as well as cope with social pressures on eating behavior and utilize social modeling and facilitation to one's own advantage. In essence, Eat-ology will help equip individuals with techniques to transform their way of eating to be aligned with the body's gastro-intelligence and in this way uncover the only sustainable diet which is one's "OWN Unique diet."

Eat-ology, therefore, brings about a holistic approach in the thinking of obesity prevention and environmental sustainability, in order to nurture bigger wholesome communities. The ease of use of the method offers a way to capitalize on the cultural psyche that mobilizes individuals to create change. In terms of childhood obesity management, the Eat-ology way of thinking

holds potential for helping children adopt "healthier" personal behaviors. These are not only instrumental to prevent excessive weight gain but are also likely to generate and support sustainable environmental practices. Eat-ology principles are simple, portable, and with training can be easily applied; these qualities are essential not only for achieving weight loss but rather for its long-term maintenance. The proposed Eat-ology approaches to weight loss are disruptive to "dieting" and maybe the key to success in combating obesity to save our resources and ultimately for our planet to go green.

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